

# Introduction to the IST hit structure & storage scheme

## StIstHit overview

The IST consists of one layer of 24 ladders with 6 sensors each. The StIstHit class therefore provides the two methods getLadder() and getSensor() which return the appropriate 'hardware' coordinate. Note that the numbering starts at 1. In addition the class has member functions to return the hit local position, max Adc time bin and the cluster size, respectively. The IST hits are stored in a tree organized similar to the SSD (Fig. 1).

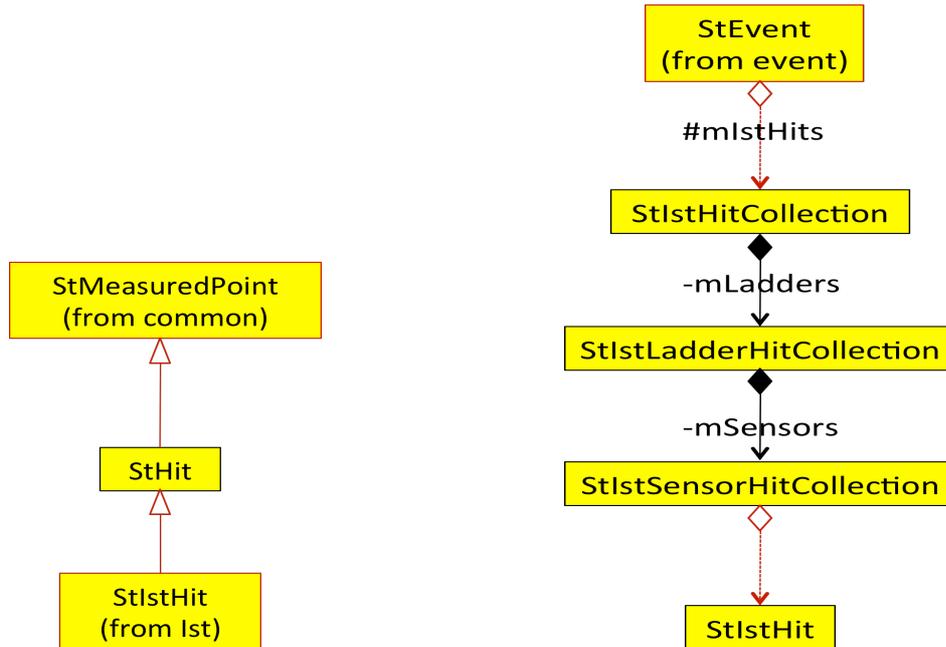


Fig. 1 **Left:** StIstHit class and its superclass. **Right:** Class diagrams of the IST hit storage scheme: ladder/sensor

The hits are stored per sensor. The following is the equivalent example for the IST hit storage scheme:

```
const int iladder = 2;
const int isensor = 3;
cout << "The IST has "
      << event->istHitCollection()->numberOfHits()
      << " hits" << endl;
StSPtrVecIstHit& theHits = event->istHitCollection()->ladder(iladder)->sensor(isensor).hits();
cout << "ladder " << iladder
     << ", sensor " << isensor << " contains "
     << theHits.size() << " hits" << endl;
for (int i=0; i<theHits.size(); i++) {
    cout << theHits[i]->position() << endl;
    cout << theHits[i]->charge() << endl;
    assert(theHits[i]->ladder() == iladder);
    assert(theHits[i]->sensor() == isensor);
}
```



## StIstHitCollection class

### Summary

### Synopsis

```
#include "StIstHitCollection.h"  
class StIstHitCollection;
```

### Description

### Related Classes

### Public Constructors

```
StIstHitCollection();
```

### Public Member Functions

```
bool addHit(StIstHit*);  
unsigned int numberOfHits() const;  
unsigned int numberOfLadders() const;  
StIstLadderHitCollection* ladder(unsigned int);  
const StIstLadderHitCollection* ladder(unsigned int) const;
```

## StIstLadderHitCollection class

### Summary

### Synopsis

```
#include "StIstLadderHitCollection.h"  
class StIstLadderHitCollection;
```

### Description

### Related Classes

### Public Constructors

```
StIstLadderHitCollection();
```

### Public Member Functions

```
unsigned int numberOfHits() const;  
unsigned int numberOfSensors() const;  
StIstSensorHitCollection* sensor(unsigned int);  
const StIstSensorHitCollection* sensor(unsigned int) const;
```

## StIstSensorHitCollection class

### Summary

### Synopsis

```
#include "StIstSensorHitCollection.h"  
class StIstSensorHitCollection;
```

### Description

### Related Classes

### Public Constructors

```
StIstSensorHitCollection ();
```

### Public Member Functions

```
StSPtrVecIstHit& hits();  
const StSPtrVecIstHit& hits() const;
```